

**Lake Kampeska, South Dakota
Summer Angler Use and Harvest Surveys
May 2012 - July 2013**

by

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Preface

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Executive Summary

- Anglers spent an estimated 14,259 hours during the summer of 2012 and 12,342 hours during the summer of 2013 fishing Lake Kameska. The mean trip length was 3.11 hours in 2012 and 2.76 hours in 2013. The mean party size was 2.11 in 2012 and 2.58 in 2013.
- Anglers caught an estimated 22,154 fish during the summer of 2012 and 9,564 fish during the summer of 2013 from Lake Kameska. Summer angler harvest was estimated at 3,277 fish in 2012 and 4,271 fish in 2013.
- Overall angler satisfaction was high. Approximately 84% of anglers during the summer of 2012 and 66% of anglers during the summer of 2013 were satisfied with their daily fishing trip. Approximately 71% of anglers were satisfied with the number, size and species of fish they caught during daily trips during the summer of 2012.
- Anglers indicated a diversity of factors that were important in their fishing trip satisfaction. Approximately 25% of anglers cited 'relaxation' and approximately 26% cited 'participation in fishing' and 'catching fish' as primary factors in satisfaction with daily fishing trips.
- Overall, anglers indicated a positive response to proposed changes in Northern Pike spearing regulations. Approximately 67% of surveyed anglers were in favor of expanded opportunity for spearing Northern Pike to inland waters statewide.

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**Lake Kampeska, South Dakota
Angler Use and Harvest Survey
May 2012 – July 2013**

Lake Kampeska is an important sport fishery, especially for residents of Watertown and Codington County. The stocking history of Lake Kampeska is extensive with the first recorded fish stocking occurring in 1914 which included Black Crappie, Bluegill, Channel Catfish and Walleye. In addition to stocking, the fish community is influenced by immigration and emigration through the channel connection to the Big Sioux River on the northeast end of the lake. A weir at 1717.8 feet above sea level, installed to reduce sedimentation into Lake Kampeska, controls seasonal water flow and fish movement through the channel. Walleye are the primary sport fish present in Lake Kampeska.

The Walleye minimum length limit of 356 mm (14 in) was removed in 2010 due to poor walleye growth and was replaced by the statewide regulation.

Lake Kampeska was previously surveyed for angler use and harvest from 1986 - 1996. Information concerning angler use and harvest is important in the ongoing fisheries management of Lake Kampeska. This report summarizes summer angler use and harvest surveys that were completed from May - August 2012 and May - July 2013.

Study Site

Lake Kampeska is a large lake approximately 2,126 hectares (5,250 acres) in size and is located in Codington County west of the city of Watertown. The lake is considered warm-water permanent and the lake basin is relatively shallow with a maximum depth of 5 m (16.4 ft). Much of the land around the lake is private and the shoreline is highly developed. Due to the large amount private property along the lake shore, public access is limited to six boat ramps and a few primitive access areas. One state park (Sandy Shore Recreational Area), one county park (Memorial Park) and two city parks (City and Jackson Parks) provide access to the lake.

Methods

A roving angler use and harvest survey with two-stage stratification was completed during the summers of 2012 and 2013. The summer angler use survey in 2012 was from May 1 to August 31. Due to late ice out and logistical issues, the 2013 survey was completed from May 15 to July 31. The first stratification unit was between weekdays and weekend days. The second stratification unit was for the time periods that the clerk was present. Because weekends typically receive increased fishing pressure most weekend days are represented in the survey. Time periods were randomly assigned to available days with weekdays and weekend/holiday days being treated separately when time periods were assigned.

The survey utilized instantaneous angler counts combined with angler interviews. Instantaneous angler counts provided fishing pressure estimates and angler interviews provided information necessary for estimating fish species catch rates, mean angler trip length, and mean party size. Two instantaneous

counts of the total number of boats fishing and all shoreline anglers present were made each surveyed day. When counts were not being made, anglers were contacted and interviewed. Angler use and harvest estimates were calculated using Creel Application Software (CAS; Soupier and Brown 2002).

Additional questions asked during interviews were used to obtain angler primary residence, fish species targeted, and angler opinions. Total length (TL; mm) measurements from angler caught fish were recorded during the interview process.

The potential economic value of the Lake Kampeska fishery was estimated by multiplying a daily expenditure of \$50 (U.S. Department of Interior, Fish and Wildlife Service, U.S. Department of Commerce, Bureau of Census 2011) times the estimated number of angler days.

Results and Discussion

Fishing Pressure

A substantial proportion of anglers interviewed during the summers of 2012 and 2013 indicated no preference for target species (35% in 2012 and 42% in 2013; Table 1). Of those anglers that indicated a preference, Walleye was the primary target species. The proportion of anglers targeting Walleye was 54% for both 2012 and 2013 (Table 1). Other species targeted include: Northern Pike, Smallmouth Bass, White Bass, and White and Black Crappie.

Angling pressure was relatively consistent during the summers of 2012 and 2013. An estimated 14,259 angler hours in 2012 and 12,342 angler hours in 2013 were spent fishing Lake Kampeska (Table 2). Approximately 81% of angler hours in 2012 and 83% of angler hours in 2013 were attributed to anglers fishing from boats (Table 2). Shore fishing at Lake Kampeska is common from ice out through the spring spawning season for walleye and white bass, much of which occurs prior to the creel survey period. Mean party size was 2.11 anglers in 2012 and 2.58 in 2013 (Table 2). Mean trip length was 3.11 hours in 2012 and 2.76 hours in 2013 (Table 2). The estimated potential economic value of the Lake Kampeska fishery during the summers of 2012 and 2013 was \$229,244 and \$223,587, respectively (Table 2).

Angler Demographics

South Dakota residents comprised a large proportion of the anglers utilizing Lake Kampeska, they represented 99% of the anglers interviewed in 2012 and 94% in 2013 (Table 3). Most South Dakota resident anglers fishing Lake Kampeska indicated they were from Watertown (87% in 2012 and 77% in 2013; Table 3). The few nonresident anglers utilizing Lake Kampeska were from Minnesota, Iowa, and Nebraska (Table 3).

Angler Catch and Harvest

Walleye

Summer Walleye catch rates were higher in 2012 than in 2013. Catch rates were 0.39 Walleye per hour in 2012 and 0.24 in 2013 (Table 4). The estimated total catch of Walleye was 5,614 in 2012 and 3,018 in 2013 (Table 5). Harvest rates were higher in 2013 than in 2012 with 0.18 Walleye

harvested per hour fished in 2012 and 0.24 in 2013 (Table 4). The estimated total harvest of Walleye was 2,504 in 2012 and 2,595 in 2013 (Table 5). Approximately 45% of Walleyes caught in 2012 and 86% in 2013 were harvested.

Mean total length of harvested Walleye was similar during the summers of 2012 and 2013. Mean total length was 401 mm (15.8 in.) in 2012 and 416 mm (16.4 in.) in 2013 (Figures 1-2). The total length of harvested Walleye ranged from 26-53 cm (10.2-20.9 in.; Figure 1) in 2012 and 33-53 cm (13.0-20.9 in.; Figure 2) in 2013. Walleye less than 356 mm (14 in) in total length comprised a small proportion of the total harvest in 2012 and 2013 despite the removal of the minimum length limit in 2010.

Northern Pike

Summer Northern Pike catch and harvest rates were relatively low. The overall catch rate ranged from 0.17 Northern Pike per hour in 2012 to 0.08 in 2013 (Table 4). The estimated total number of Northern Pike caught was 2,434 in 2012 and 961 in 2013 (Table 5). Harvest was minimal with an estimated 91 fish harvested in 2012 and none were harvested in 2013 (Table 5). Responses from anglers indicated strong support for opening all South Dakota inland waters to Northern Pike spearing with approximately 67% of interviewed anglers in favor this regulation change.

Yellow Perch and Bluegill

Yellow Perch and Bluegill made up a small proportion of the total angler catch on Lake Kampeska. Estimates were less than 400 Yellow Perch caught and fewer than 150 harvested each of the two years surveyed (Table 5). Estimates were less than 100 Bluegill caught each summer, though harvest rates were high for Bluegill (74% in 2012 and 100% in 2013; Tables 4-5). Bluegill catch and harvest may be higher than represented due to difficulty interviewing anglers from private docks.

Smallmouth Bass

Smallmouth Bass were common in the angler catch on Lake Kampeska despite few anglers targeting them. Catch rates ranged from 0.17 Smallmouth Bass per hour fished in 2012 to 0.10 in 2013. The total estimated angler catch of smallmouth bass was 2,405 in 2012 and 1,186 in 2013 (Tables 4-5). Harvest rates were low with an estimated 131 Smallmouth Bass harvested in 2012 and none harvested in 2013 (Tables 4-5).

White Bass

White Bass comprised a large proportion of the angler catch in Lake Kampeska despite few anglers targeting White Bass. Catch rates ranged from 0.72 White Bass per hour in 2012 to 0.11 in 2013 (Table 4). Total catch estimates were 10,289 in 2012 and 1,382 in 2013 (Table 5). Harvest of White Bass was low with an estimate of 352 harvested in 2012 and 192 in 2013 (Table 5).

Crappie

Both Black and White Crappie are present in Lake Kampeska and contribute to the sport fishery. In this report both species are combined and will be referred to as crappie. Crappie catch rates were low for all months surveyed except for July 2013. Catch rates for all months sampled, except July 2013, ranged from <0.01 to 0.03 crappie per hour (Table 4). Angler catch of crappie was substantially higher in July 2013 at 0.47 crappie per hour (Table 4). The total catch of crappie in 2012 was estimated at 291

(Table 5). Approximately 2,041 of 2,226 crappie caught in 2013 were caught during July (Table 5). Total estimated harvest of crappie was 121 in 2012 and 1,267 in 2013 (Table 5).

Other species

Other species reported as being caught but in low numbers during the 2012 and 2013 summer angler surveys at Lake Kampeska include: bullhead (including both Black and Yellow bullhead), Channel Catfish, Largemouth Bass and Rock Bass.

Angler Opinions

Angler Satisfaction

In 2012 and 2013 anglers were asked to quantify their angling satisfaction considering all factors. Angler satisfaction during the summer of 2012 was high with approximately 84% of anglers indicating they were satisfied with their fishing trip (Table 6). Approximately 43% indicated they were “very satisfied” (Table 6). Dissatisfied anglers comprised approximately 10% of interviewed anglers in 2012 (Table 6).

Angler satisfaction was lower in 2013 than in 2012. Approximately 66% of interviewed anglers indicated they were satisfied with their fishing trip (Table 6). Angler dissatisfaction increased in 2013 with approximately 15% of anglers dissatisfied with their fishing trip (Table 6). An large increase in the proportion of anglers indicating neutral satisfaction was observed between 2012 and 2013 with 6% being neutral in 2012 and 17% in 2013 (Table 6).

The difference observed in angler satisfaction between the two summers likely can be attributed to angling success. Catch rates for all species except crappie were lower in 2013 than in 2012. However, it is interesting to note that angler satisfaction was lower in 2013 despite Walleye harvest rates and total fish harvested being higher in 2013 than in 2012. This result correlates to observed angler opinion with only 6% of anglers citing harvest as the most important factor to consider in the success of a fishing trip (Table 8).

In 2012 anglers were also asked to quantify satisfaction based on size, species and number of fish caught. Angler satisfaction was high with 71% indicating they were satisfied. Approximately 48% indicated they were “very satisfied” and approximately 21% indicated they were dissatisfied (Table 7).

Angling Trip Success

In 2013 anglers were asked what the most important factor to them in determining the success of a fishing trip. The responses, ‘participating in fishing’ and ‘catching fish’ each comprised approximately 26% of angler responses (Table 8). ‘Relaxation’ was also a common response from approximately 25% of anglers interviewed (Table 8). ‘Harvesting fish’, ‘being with friends’ and ‘other’ were cited by anglers infrequently (Table 8).

Northern Pike Spearing Regulation

Anglers were asked their opinion on opening spearing of Northern Pike through the ice statewide. Most anglers (67%; Table 9) indicated they were in favor of such a regulation. Approximately 17% of anglers had no opinion and 17% were opposed to changing the regulation (Table 9).

Table 1. Angler primary target species (percentage) by month for anglers fishing Lake Kampeska, South Dakota during the summer of 2012 (May - August) and 2013 (May - July). *May 2013 includes only May 15-31. ANY=anything, NOP=Northern Pike, WAE=Walleye, SMB=Smallmouth Bass, WHB=White Bass, BLC/WHC=Black and White Crappie combined.

		Percent (%) of Anglers					
Year	Month	ANY	NOP	WAE	SMB	WHB	BLC/WHC
2012	May	38.5	2.6	41.0	7.7	2.6	7.7
	June	30.3	0.0	66.7	0.0	0.0	0.0
	July	41.4	0.0	51.7	6.9	0.0	0.0
	August	22.2	11.1	61.1	5.6	0.0	0.0
	Overall	34.8	2.5	54.2	5.1	0.9	2.5
2013	*May	42.3	0.0	57.7	0.0	0.0	0.0
	June	40.0	5.0	50.0	0.0	0.0	5.0
	July	42.1	0.0	52.6	0.0	0.0	0.0
	Overall	41.5	1.5	53.9	0.0	0.0	1.5

Table 2. Angler demographics by month and overall summer including; the number of interviews, estimated angler hours, estimated angler days, estimated economic value (Eco value; \$), estimated trip length (h), average party size, percent (% SD) of interviewed anglers that were South Dakota residents and percent (% Boat) of angler hours attributed to angling from a boat at Lake Kampeska, South Dakota during the summer of 2012 (May - August) and 2013 (May - July). *May 2013 includes only May 15-31. One standard error is provided in parenthesis when calculated.

Year	Month	# interviews	Angler hours	Angler days	Eco value (\$)	Trip length (hr)	Party size	% SD	% Boat
2012	May	39	4,463 (1,449)	1,757	87,854	2.54 (0.57)	2.29 (1.18)	100.0	72.7
	June	32	4,747 (1,498)	1,434	71,706	3.31 (---)	2.24 (0.48)	100.0	89.8
	July	29	3,093 (645)	871	43,563	3.55 (1.26)	1.81 (0.85)	93.1	81.8
	August	18	1,956 (508)	643	32,171	3.04 (---)	2.10 (1.21)	100.0	76.3
	Overall	118	14,259 (2,240)	4,585	229,244	3.11 (0.35)	2.11 (0.49)	98.5	80.9
2013	*May	26	2,568 (460)	837	41,824	3.07 (---)	2.44 (1.53)	92.3	69.7
	June	20	5,468 (1,079)	2,048	102,397	2.67 (---)	2.81 (0.97)	95.0	89.4
	July	19	4,305 (1,871)	1,606	80,317	2.68 (---)	2.44 (0.34)	94.7	83.3
	Overall	65	12,342 (2,208)	4,471	223,587	2.76 (---)	2.58 (0.52)	93.9	83.2

Table 3. Home residence (percentage) of anglers fishing Lake Kampeska, South Dakota during the summer of 2012 (May - August) and 2013 (May - July). 'Resident' is divided between the city of Watertown (zip code 57201) and all other areas of South Dakota (zip code 57---).

	Percent (%) of anglers	
Home Residence	2012	2013
Resident	98.3	93.8
Watertown	87.3	76.9
rest of SD	11.0	16.9
Non-Resident	1.7	6.2
Iowa	0.0	1.5
Minnesota	1.7	3.1
Nebraska	0.0	1.5

Table 4. Estimated monthly and total catch rate per hour fished (C/h) and harvest rate per hour fished (H/h) for Walleye (WAE), Northern Pike (NOP), Yellow Perch (YEP), Smallmouth Bass (SMB), White Bass (WHB), Bluegill (BLG), and crappie (BLC/WHC) at Lake Kampeska, South Dakota during the summer of 2012 (May - August) and 2013 (May - July). *May 2013 includes only May 15-31. One standard error is provided in parenthesis when calculated.

		WAE		NOP		YEP		SMB		WHB		BLG		BLC/WHC	
Year	Month	C/h	H/h	C/h	H/h	C/h	H/h	C/h	H/h	C/h	H/h	C/h	H/h	C/h	H/h
2012	May	0.17 (0.11)	0.07 (0.11)	0.10 (0.16)	<0.01 (<0.01)	<0.01 (<0.01)	0.00 (0.00)	0.08 (0.10)	0.03 (0.04)	0.86 (0.41)	0.05 (0.08)	0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
	June	0.58 (0.37)	0.25 (0.21)	0.11 (0.11)	0.00 (0.00)	0.03 (0.03)	0.01 (0.01)	0.18 (0.07)	0.00 (0.00)	0.45 (0.26)	0.01 (0.01)	0.00 (0.00)	0.00 (0.00)	0.03 (0.02)	0.01 (0.01)
	July	0.61 (0.22)	0.30 (0.14)	0.33 (0.07)	0.00 (0.00)	0.07 (0.04)	<0.01 (<0.01)	0.19 (0.06)	0.00 (0.00)	0.85 (0.27)	0.02 (0.02)	0.00 (0.00)	0.00 (0.00)	0.03 (0.01)	0.02 (0.01)
	August	0.13 (0.11)	0.03 (0.03)	0.24 (---)	<0.01 (<0.01)	0.01 (0.01)	<0.01 (<0.01)	0.31 (0.30)	0.00 (0.00)	0.88 (0.61)	0.00 (0.00)	<0.01 (<0.01)	0.00 (---)	0.01 (0.01)	0.00 (0.00)
	Overall	0.39 (0.13)	0.18 (0.07)	0.17 (0.08)	<0.01 (<0.01)	0.03 (0.01)	0.01 (<0.01)	0.17 (0.07)	0.01 (0.01)	0.72 (0.19)	0.02 (0.02)	0.01 (<0.01)	<0.01 (<0.01)	0.02 (0.01)	0.01 (<0.01)
2013	*May	0.34 (0.10)	0.23 (0.09)	0.05 (0.02)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.18 (0.12)	0.04 (0.04)	0.01 (0.01)	0.01 (0.01)	0.00 (0.00)	0.00 (0.00)
	June	0.03 (0.02)	0.02 (0.01)	0.04 (0.01)	0.00 (0.00)	0.02 (0.04)	0.00 (0.00)	0.11 (0.13)	0.00 (0.00)	0.04 (0.02)	0.00 (0.00)	0.01 (0.01)	0.01 (0.01)	<0.01 (0.01)	<0.01 (0.01)
	July	0.46 (0.36)	0.44 (0.35)	0.14 (0.08)	0.00 (0.00)	0.04 (0.03)	0.03 (0.03)	0.14 (0.08)	0.00 (0.00)	0.17 (0.21)	0.02 (0.03)	0.00 (0.00)	0.00 (0.00)	0.47 (0.45)	0.29 (0.38)
	Overall	0.24 (0.11)	0.21 (0.11)	0.08 (0.02)	0.00 (0.00)	0.02 (0.02)	0.01 (0.01)	0.10 (0.14)	0.00 (0.00)	0.11 (0.07)	0.02 (0.01)	0.01 (<0.01)	0.01 (<0.01)	0.13 (0.10)	0.07 (0.09)

Table 5. Estimated monthly and total catch and harvest of Walleye (WAE), Northern Pike (NOP), Yellow Perch (YEP), Smallmouth Bass (SMB), White Bass (WHB), Bluegill (BLG), crappie (BLC/WHC), and total at Lake Kampeska, South Dakota during summer of 2012 (May - August) and 2013 (May - July). *May 2013 includes only May 15-31. One standard error is provided in parenthesis when calculated.

Year	Month	WAE		NOP		YEP		SMB		WHB		BLG		BLC/WHC		Total	
		C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H
2012	May	750 (309)	304 (134)	425 (279)	14 (18)	14 (14)	0 (0)	347 (196)	131 (110)	3,839 (1,700)	232 (146)	75 (48)	61 (46)	41 (44)	41 (44)	5,745 (1,343)	783 (301)
	June	2,737 (882)	1,200 (587)	517 (217)	0 (0)	144 (96)	67 (60)	858 (115)	0 (0)	2,113 (712)	45 (53)	0 (0)	0 (0)	134 (73)	23 (26)	6,502 (2,029)	1,335 (652)
	July	1,880 (450)	934 (248)	1,022 (279)	0 (0)	216 (146)	12 (9)	593 (141)	0 (0)	2,624 (273)	74 (53)	0 (0)	0 (0)	95 (35)	58 (26)	6,677 (694)	1,079 (313)
	August	247 (186)	65 (45)	471 (229)	7 (5)	22 (18)	7 (5)	607 (576)	0 (0)	1,713 (1,122)	0 (0)	7 (---)	0 (---)	22 (11)	0 (0)	3,230 (1,145)	80 (55)
	Overall	5,614 (1,053)	2,504 (653)	2,434 (505)	22 (19)	396 (177)	87 (60)	2,405 (635)	131 (110)	10,289 (2,175)	352 (164)	82 (48)	61 (46)	291 (93)	121 (58)	22,154 (2,777)	3,277 (786)
2013	*May	872 (206)	591 (216)	134 (66)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	458 (290)	95 (98)	19 (15)	19 (15)	0 (0)	0 (0)	1,891 (382)	705 (289)
	June	178 (159)	89 (83)	210 (33)	0 (0)	121 (239)	0 (0)	595 (722)	0 (0)	194 (117)	0 (0)	48 (38)	48 (38)	19 (27)	19 (27)	1,470 (966)	156 (175)
	July	1,968 (1,294)	1,916 (1,290)	618 (217)	0 (0)	167 (108)	149 (110)	591 (215)	0 (0)	731 (795)	97 (106)	0 (0)	0 (0)	2,041 (1,731)	1,249 (1,566)	6,203 (4,177)	3,410 (2,779)
	Overall	3,018 (1,320)	2,595 (1,311)	961 (229)	0 (0)	288 (262)	149 (110)	1,186 (753)	0 (0)	1,382 (855)	192 (144)	67 (41)	67 (41)	2,226 (1,732)	1,267 (1,566)	9,564 (4,304)	4,271 (2,799)

Table 6. Lake Kampeska, South Dakota angler responses (percentage of total) during the summer of 2012 (May - August) and 2013 (May - July) to the question: “Considering all factors, how satisfied are you with your fishing trip today?” N is the number of responses.

	Percent (%)	
Response	2012 (n=70)	2013 (n=65)
Very Satisfied	42.9	20.0
Moderately Satisfied	24.3	24.6
Slightly Satisfied	17.1	21.5
Neutral	5.7	16.9
Slightly Dissatisfied	10.0	7.7
Moderately Dissatisfied	0.0	1.5
Very Dissatisfied	0.0	6.2

Table 7. Lake Kampeska, South Dakota angler responses (percentage of total) during the summer of 2012 (May - August) to the question: “Considering species, size and number of fish caught, how satisfied are you with your fishing trip today?” N is the number of responses.

	Percent (%)
Response	2012 (n=48)
Very Satisfied	47.9
Moderately Satisfied	16.7
Slightly Satisfied	6.3
Neutral	8.3
Slightly Dissatisfied	10.4
Moderately Dissatisfied	8.3
Very Dissatisfied	2.1

Table 8. Lake Kampeska angler response (percentage of total) during the summer of 2013 (May - July) to the question “What is the most important factor to you in defining a successful fishing trip?” N is the number of responses.

	Percent (%)
Response	2013 (n=65)
Relaxation	24.6
Harvesting Fish	6.2
Participate	26.2
Catching Fish	26.2
Being with Friends	6.2
Other	10.8

Table 9. Lake Kampeska angler response (percentage of total) during the summer of 2012 (May - August) to the question “Would you be in favor or against allowing for northern pike spearing through the ice statewide?” N is the number of responses.

	Percent (%)
Response	2012 (n=48)
In Favor	66.7
Against	16.7
No Opinion	16.7

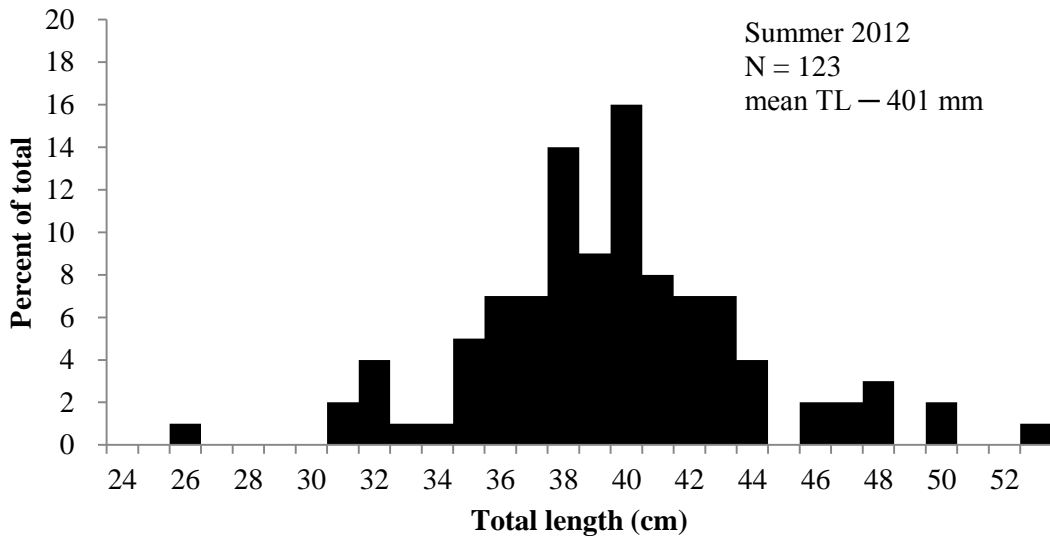


Figure 1. Length frequency histogram of Walleye harvested by anglers fishing Lake Kampeska during the summer of 2012 (May - August). N is the total number of fish measured and mean TL is the mean total length (mm) of harvested Walleye.

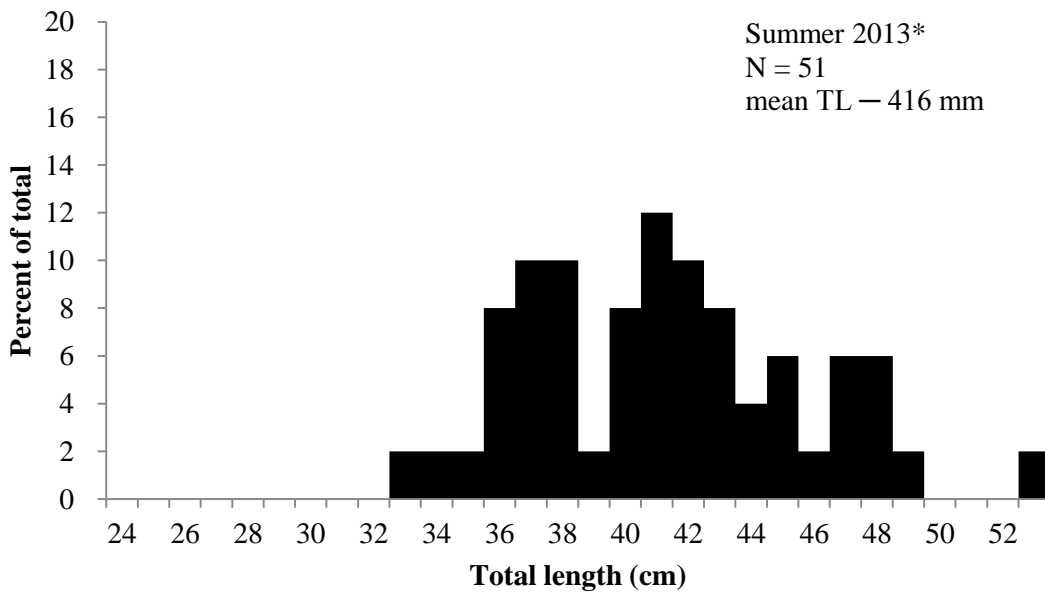


Figure 2. Length frequency histogram of Walleye harvested by anglers fishing Lake Kampeska during the summer of 2013 (May – July). May 2013 (*) was calculated from May 15-31 due to lack of data. N is the total number of fish measured and mean TL is the mean total length (mm) of harvested Walleye.

References

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